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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/786,432	03/05/2001	Christophe Chevance	PF980059	1692

7590 04/09/2008  
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EXAMINER
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ART UNIT	PAPER NUMBER
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2621

MAIL DATE	DELIVERY MODE
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04/09/2008

PAPER

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* CHRISTOPHE CHEVANCE,  
PIERRE RUELOU, and DOMINIQUE THOREAU

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Appeal 2007-3604  
Application 09/786,432  
Technology Center 2600

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Decided: April 9, 2008

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Before ANITA PELLMAN GROSS, JOHN A. JEFFERY, and KARL  
EASTHOM, *Administrative Patent Judges*.

JEFFERY, *Administrative Patent Judge*.

DECISION ON APPEAL

1 Appellants appeal under 35 U.S.C. § 134 from the Examiner's rejection of claims 1-4, 7, 10, and 11. Claims 5, 6, 8, 9, 12 and 13 have been indicated as containing allowable subject matter (Ans. 10-11; App. Br. 2). We have jurisdiction under 35 U.S.C. § 6(b). We reverse.

## STATEMENT OF THE CASE

Appellants invented a method of motion estimation for a series of images. The process includes the step of segmentation of a video image into blocks. A histogram is generated representing the horizontal and vertical components of the movement vectors associated with the image of the series. Predominant vectors within the histogram are located using various techniques. One of the predominant vectors is then reassigned to the blocks. The reassignment can be enhanced by scaling the vectors using spatial and temporal filtering.<sup>1</sup> Claim 1 is illustrative:

1. Method of movement estimation for a sequence of images including segmentation of a current video image into image blocks, movement estimation per image block between the current image and a previous image in order to obtain a movement vector field for said current image, a stage of reassignment of a vector to a block by selecting one movement vector from among N predominant vectors, wherein the predominant vectors are the ones of the group of vectors belonging to the movement vector field for said current image and at least to the movement vector field for a preceding image corresponding to a movement vector field between said preceding image and a further preceding image, the vectors being scaled according to the temporal distance to which they correspond.

The Examiner relies on the following prior art references to show unpatentability:

Kerdranvrat	US 5,193,001	Mar. 9, 1993
Lee	US 6,317,460 B1	Nov. 13, 2001 (filed May 12, 1998)

The Examiner's rejection is as follows:

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<sup>1</sup> See generally Spec. 1:25-35 and 3:11-5:7.

1. Claims 1-4, 7, 10, and 11 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Kerdranvrat and Lee.

Rather than repeat the arguments of Appellants or the Examiner, we refer to the Brief<sup>2</sup> and the Answer<sup>3</sup> for their respective details. In this decision, we have considered only those arguments actually made by Appellants. Arguments, which Appellants could have made but did not make in the Brief, have not been considered and are deemed to be waived. *See* 37 C.F.R. § 41.37(c)(1)(vii).

### OPINION

In rejecting claims under 35 U.S.C. § 103, it is incumbent upon the Examiner to establish a factual basis to support the legal conclusion of obviousness. *See In re Fine*, 837 F.2d 1071, 1073 (Fed. Cir. 1988). In so doing, the Examiner must make the factual determinations set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966).

Discussing the question of obviousness of a patent that claims a combination of known elements, the Court in *KSR Int'l v. Teleflex, Inc.*, 127 S. Ct. 1727 (2007) explains:

When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless

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<sup>2</sup> We refer to the most recent Appeal Brief filed August 22, 2006 throughout this opinion.

<sup>3</sup> We refer to the Examiner's Answer mailed November 17, 2006 throughout this opinion.

its actual application is beyond his or her skill. *Sakraida* [v. *AG Pro, Inc.*, 425 U.S. 273 (1976)] and *Anderson's-Black Rock, Inc. v. Pavement Salvage Co.*, 396 U.S. 57 (1969)] are illustrative—a court must ask whether the improvement is more than the predictable use of prior art elements according to their established functions.

*KSR*, 127 S. Ct. at 1740. If the claimed subject matter cannot be fairly characterized as involving the simple substitution of one known element for another or the mere application of a known technique to a piece of prior art ready for the improvement, a holding of obviousness can be based on a showing that “there was an apparent reason to combine the known elements in the fashion claimed.” *Id.* at 1740-41. Such a showing requires “some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness. . . . [H]owever, the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.” *Id.* at 1741.

If the Examiner’s burden is met, the burden then shifts to the Appellants to overcome the prima facie case with argument and/or evidence. Obviousness is then determined on the basis of the evidence as a whole and the relative persuasiveness of the arguments. *See In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992).

Regarding independent claim 1, the Examiner's rejection essentially finds that Kerdranvrat discloses a method of movement estimation for a sequence of images with all the features recited in claim 1, except for the step of scaling the vectors according to the temporal distance as claimed. The Examiner cites Lee to teach this missing limitation. In view of Lee’s teaching, the Examiner concludes that it would have been obvious to one of

ordinary skill in the art at the time of the invention to apply a temporal scaling technique to the predominant vectors of Kerdranvrat “in order to reduce the processing load” (Ans. 4).

Appellants mainly argue that Kerdranvrat fails to disclose or teach the limitation:

a stage of reassignment of a vector to a block by selecting one movement vector from among N predominant vectors, wherein the predominant vectors are the ones of the group of vectors belonging to the movement vector field for said current image and at least to the movement vector field for a preceding image

(App. Br. 8-9). Appellants state that the claimed invention selects a predominant vector from two movement fields, while Kerdranvrat selects a predominant vector from one movement field (App. Br. 8-9).

The issue before us is whether Kerdranvrat discloses, teaches, or suggests the N predominant vectors used to select the reassigned movement vector for a block are from the group of vectors belonging to: (1) the movement vector field of the current image and (2) the movement vector field for the preceding image. For the following reasons, we find that Kerdranvrat does not.

Kerdranvrat discloses a method of movement estimation for a sequence of images. The method includes the steps of segmentation of a video image into image blocks and reassignment of a vector to each block by selecting one movement vector from among N predominant vectors. The  $N_t$  dominant vectors in Kerdranvrat are located through a series of steps, including extraction from a table containing vector values from the current image and elimination of secondary maxima. Kerdranvrat, then, includes a filtering step and arrives at N predominant vectors (Kerdranvrat, col. 2, ll.

36-39 and 44-47, col. 3, ll. 31-39, col. 5, l. 12 - col. 7, l. 41; Figs. 1 and 5-8b).

The later filtering step of Kerdranvrat, in our view, does not result in the N predominant vectors being from a group of vectors belonging to: (1) the movement vector field for said current image *and* (2) the movement vector field for the preceding image. At best, the step involves a comparison of the dominant vectors from the current image with the dominant vectors extracted from the previous image. MEM1 contains the  $N_{\max}$  vectors or vectors per one image quarter from the current image, and MEM2 contains the dominant vectors from the previous image. When one of the vectors in MEM1 is distant from all the vectors in MEM2, this vector is eliminated from the table SORT. There is no discussion of transferring the vectors in MEM2 into MEM1 or the table SORT. In the end, while a comparison is made between vectors of the current and previous images, only the  $N_{\max}$  vectors close to the vectors in MEM2 or N predominant vectors from the current image are sent to the next module for reassignment (Kerdranvrat, col. 7, ll. 11-41; Figs. 8a-b and 11).

The Examiner argues “after the SORT table is time filtered, both its predominant vectors (current image), and the dominant vectors from the MEM2 table (preceding image) are transferred to the reassignment module” (Ans. 7). We do not find support for this interpretation. Kerdranvrat discloses the  $N_{\max}$  vectors from the current image, not the vectors from the MEM2 table, are sent to and used in the reassignment module (Kerdranvrat, col. 7, ll. 33-36 and 44-50). When looking at this passage of Kerdranvrat in its entirety, “these vectors” discussed in column 7, line 35 of Kerdranvrat as being transmitted to the next module refer to the vectors in the table SORT.

To support this interpretation, Kerdranvrat further discloses the values from the table SORT, not MEM2, are used in calculating the reassigned values for each block (Kerdranvrat, col. 7, l. 55- col. 8, l. 10). This indicates the blocks are reassigned vectors from only the table SORT or vectors from the current image.

The Examiner admits that the vector values in the table SORT are close but different from the vector values in MEM2 (Ans. 7). In our view, if a block was reassigned a movement vector from among vectors of MEM2 or a previous image, then the block would have a reassigned value that differs from the predominant vectors in the table SORT, as described by Kerdranvrat, and would be contrary to Kerdranvrat's teachings (Kerdranvrat, col. 7, l. 55 – col. 8, l. 10; Fig. 11). As stated previously, Kerdranvrat uses only  $N_{\max}$  vector values from the current image that are in the table SORT when reassigning the blocks.

Based on the above findings, we conclude that Kerdranvrat does not disclose or reasonably teach the predominant vectors used in the reassignment step are from the group of vectors belonging to the movement vector field of the current image and the movement vector field of the preceding image as recited in claim 1.

Appellants also argue that Lee does not provide a teaching for this missing limitation (App. Br. 9-10). Lee discloses a method for movement estimation of a sequence of images in order to reduce computational requirements (Lee, col. 1, ll. 14-16 and col. 3, ll. 53-58) and discusses assigning blocks motion vectors based on a block-based approach and other conventional techniques, such as SAD, SSD, or MAD (Lee, col. 1, l. 60 - col. 2, l. 13 and col. 6, ll. 7-11). However, Lee does not describe any details



regarding the reassignment of the motion vectors, and in particular, there is no discussion of a reassignment from among N predominant vectors chosen from the group of vectors belonging to the movement vector field of the current image and the movement vector field of the preceding image. As such, Lee does not disclose, teach, or suggest the above-discussed missing limitation.

As neither reference discloses or teaches the step of reassigning a vector to a block from among N predominant vectors chosen from the group of vectors belonging to the movement vector field of the current image and the movement vector field of the preceding image, Kerdranvrat, Lee, and their combination do not provide a persuasive teaching of reassigning a vector to a block by selecting one movement vector from among N predominant vectors, wherein the predominant vectors are the ones of the group of vectors belonging to the movement vector field for the current image and at least to the movement vector field for a preceding image as recited in claim 1.

For the above reasons, we will not sustain the Examiner's rejection of independent claim 1 nor dependent claims 2-4, 7, 10, and 11 for similar reasons.

#### DECISION

We have not sustained the Examiner's rejections with respect to any of the claims on appeal. Therefore, the Examiner's decision rejecting claims 1-4, 7, 10, and 11 is reversed.

Appeal 2007-3604  
Application 09/786,432

REVERSED

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